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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/512,107	02/24/2000	Munchito Kumagai	50073-028	5851

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WASHINGTON, DC 20005-3096

EXAMINER

DUONG, THOI V

ART UNIT	PAPER NUMBER
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2871

DATE MAILED: 04/14/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/512,107

Applicant(s)

KUMAGAI ET AL.

Examiner

Thoi V Duong

Art Unit

2871

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 03 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 January 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-6, 13 and 16-18 ~~is/are~~ pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-6, 13 and 16-18 ~~is/are~~ rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to the Amendment, Paper No. 8, filed January 16, 2003.

Accordingly, claims 2, 4, 3 and 5 were amended, claims 1, 7-12, 14 and 15 were cancelled, and new claim 18 was added. Currently, claims 2-6, 13, and 16-18 are pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claims 2-6, 13, and 16-18 have been considered but are moot in view of the new ground(s) of rejection.

With respect to claim 13, Applicant argued that the Examiner neither referred to a reference numeral nor cited a column/line in Tsuda to support the feature recited in the claim. The Examiner disagrees with the Applicant's remarks since Figs. 1 and 2 clearly show that said semiconductor film (208) is formed in a picture region excluding the region where said scanning line (204), said signal lines (211), and said contact hole are formed (see also Figs. 3F, 3G and 5C).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4. Claims 13 and 17 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuda et al. (USPN 6,262,783 B1).

As shown in Figs 1 and 2, Tsuda discloses a reflection type liquid crystal display comprising:

- a transparent insulating substrate 201;

- scanning lines 204, a scanning electrode 203, and common electrode 205 wiring formed on said insulating substrate;

- an insulating film 207 formed on said scanning lines, said scanning electrode and said common electrode wiring;

- a semiconductor layer 208 (see also Fig. 3C) formed on said scanning electrode through said insulating film;

- a first electrode 212 and a second electrode 213 forming a semiconductor element with said semiconductor layer, and signal lines 211 connected to said first electrode;

- an innerlayer photosensitive insulating film 230 which is formed on said first electrode, said second electrode and said signal lines, absorbs difference in level of

said scanning lines, said first electrode, said second electrode and said signal lines, and possesses minute unevenness on the surface (col. 9, lines 12-25);

a first transparent substrate 201 (col. 1, lines 52-54) having a reflex picture element electrode 423 composed of a high reflex metal film Al (col. 9, lines 47-50) having a configuration transferred to said interlayer insulating film as the unevenness on the surface of said interlayer insulating film and electrically connected to said second electrode through a contact hole provided in said interlayer insulating film; and

a second transparent substrate 301 sandwiching and holding a liquid crystal material 250 with said first substrate (col. 1, lines 52-54), which is provided with a color filter 303, an opposed electrode 303 and so on,

wherein said semiconductor film 208 (on top of the scanning electrode 203) is formed in a picture element region excluding the region where said scanning lines, said signal lines, and said the contact hole are formed (also see Figs. 3F, 3G and 5C).

Tsuda also discloses a method for manufacturing the above reflection type liquid crystal display shown from Figs. 3A to 5D, comprising:

a process of forming scanning lines (not shown), a scanning electrode 203, and common electrode wiring 205 on a transparent insulating substrate 201;

a process of forming an insulating film 207 on said scanning lines, said scanning electrode and said common electrode wiring;

a process of forming a semiconductor layer 208 on said scanning electrode through said insulating film, and forming a semiconductor film in a predetermined region;

a process of forming a first electrode 212 and a second electrode 213 forming a semiconductor element 230 (see Fig. 2) with said semiconductor layer, and forming signal lines 211;

a process of forming an interlayer insulating film 420 having a contact hole at a predetermined position and desired unevenness on the surface by applying photosensitive resin on said first electrode, said second electrode and said signal lines, and conducting exposure and development (col. 8, line 66 through col. 9, line 25); and

a process of forming a reflex picture element electrode 423 having a configuration of transferred unevenness on the surface of said interlayer insulating film and electrically connected to said second electrode through said contact hole by forming a high reflex metal film (Al) on said interlayer insulating film and in said contact hole, and conducting patterning (col. 9, lines 43-54).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda et al. (USPN 6,262,783 B1) in view of Takatsu et al. (USPN 5,434,026).

As shown from Figs. 1, 2, and 3A-5D, Tsuda discloses a method for manufacturing the above reflection type liquid crystal display, comprising:

forming plural scanning lines 204 and plural signal lines 211 crossing said scanning lines on an insulating substrate 201; forming a switching element 230 in each of picture element regions divided by said scanning lines and said signal lines;

forming an interlayer insulating film 230 having appropriate unevenness of an inseparable pattern in the picture element region and having a contact hole of a separable pattern (Fig. 5B) on a drain electrode 213 of said switching element by plainly applying a photosensitive insulating resin 420 on said substrate so as to dissolve difference in level caused by said scanning lines, said signal lines, and said switching element, and conducting exposure and development while changing an amount of exposure (col. 8, line 66 through col. 9, line 45); and

forming a reflex picture element electrode 423 having unevenness due to said interlayer insulating film at a position conforming to each of the picture element regions and which is electrically connected to said switching element through said contact hole, by patterning after forming a high reflex film on said interlayer insulating film (Fig. 5D),

wherein in the process of forming the interlayer insulating film, the insulating resin is exposed by divisional (split) exposure in which the inseparable pattern is arranged on a mask as shown in Fig. 4A and the separable pattern is arranged on a second mask as shown in Figs. 4B and 5A.

Tsuda discloses a method for manufacturing a reflection type liquid crystal display that is basically the same as that recited in claims 2 and 4 except for the exposure value of the separable pattern and the inseparable pattern. Takatsu discloses a method of determining exposure conditions for an exposure device such as a stepper

for manufacturing a liquid crystal display device (col. 1, lines 12-19). As shown in Fig. 1C, an inseparable pattern of a photoresist layer at position b1 is exposed to light intensity of 20 and a separable pattern of the photoresist layer at position a1 is exposed to light intensity of 75. Accordingly, the inseparable pattern is exposed by a predetermined exposure amount of 27 % of the exposure amount for the separable pattern. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Tsuda with the teaching of Takatsu by predetermining exposure conditions for the separable pattern and the inseparable pattern so as to obtain a desired insulating resin having appropriate unevenness of the inseparable pattern in the picture element region and having a contact hole of the separable pattern.

7. Claims 3, 5, 16 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda et al. (USPN 6,262,783 B1) in view of Kiryu et al. (USPN 5,368,962).

With respect to claims 3, 5, and 18, as shown in Fig. 4A, Tsuda further discloses a mask comprising a light-shielding region such as the gate signal line 204 and the common electrode line 205 made of light-shielding material (col. 9, lines 2-7). As known in the art, a Cr/CrOx film may be used as light-shielding material. Tsuda discloses a method for manufacturing a reflection type liquid crystal display that is basically the same as that recited in claims 3, 5, 6 and 18 except that Tsuda does not disclose any shielding member disposed for cutting the UV rays for the inseparable pattern. Kiryu discloses a masking film comprising a peelable, transparent UV filter layer provided on

a transparent substrate for cutting ultraviolet rays. As shown in Fig. 4, the spectral transmittance of the masking film is greater than 50 % (col. 2, lines 1-14 and col. 5, lines 10-25). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Tsuda in Fig. 4A with the teaching of Kiryu by sticking a peelable, transparent UV filter layer on the substrate 201 for cutting the UV rays at a predetermined value for the inseperable pattern.

With respect to claim 16, Tsuda discloses a method for manufacturing a reflection type liquid crystal display that is basically the same as that recited in claim 16 except for a process of sticking an ultraviolet-cut film on a face of the transparent insulating substrate opposite to the face where said photosensitive resin is applied and a process of peeling (exfoliating) said ultraviolet-cut film before applying a development. Kiryu discloses a masking film comprising a peelable, transparent ultraviolet-cut film provided on a transparent substrate for cutting ultraviolet rays. As shown in Fig. 4, the spectral transmittance of the masking film is greater than 50 % (col. 2, lines 1-14 and col. 5, lines 10-25). Kiryu teaches that the ultraviolet-cut film once peeled from the substrate may be resticked to the substrate for reuse of the masking film (col. 5, lines 26-30). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Tsuda with the teaching of Kiryu by sticking an ultraviolet-cut film on a face of the transparent insulating substrate 201 opposite to the face where said photosensitive resin is applied and peeling the ultraviolet-cut film before the substrate is developed in a developing solution for reuse of the masking film.

8. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Tsuda et al. (USPN 6,262,783 B1) in view of Kiryu et al. (USPN 5,368,962) as applied to claims 3, 5, 16 and 18 and further in view of Aggas et al. (USPN 5,994,157).

The method of Tsuda as modified in view of Kiryu above includes all that is recited in claim 6 except for forming the UV filter layer of an a-Si film. As shown in Fig. 2(a), Aggas discloses a UV filter 20 provided on a glass substrate 61 for cutting about 80% of the UV rays made of (col. 7, lines 25-37). Aggas teaches that amorphous silicon (a-Si) is used for UV filter layer to enhance UV blocking or absorbing characteristics while maintaining substantial transparency to many visible wavelengths (col. 7, lines 10-24). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify the method of Tsuda with the teaching of Aggas by employing a UV filter layer made of a-Si so as to enhance UV blocking or absorbing characteristics while maintaining substantial transparency to many visible wavelengths.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

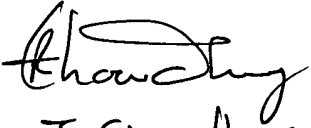
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thoi V. Duong whose telephone number is (703) 308-3171. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm.

Art Unit: 2871

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim, can be reached at (703) 305-3492.

Thoi Duong

04/06/2003


T. Chowdhury
Primary Examiner